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(56) Documents cited
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(58) Field of search
G1R

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(54) Improvements in or Relating to
Variable-area Fluid Flowmeters

(57) The use of a conductive coating
on the interior surface of the tube of a
variable-area fluid flowmeter, in order

to prevent sticking of the float to the
tube wall as a result of static electrical
charges, has been found to result in
corrosion of the float, and this is
prevented by employing a float made
of titanium metal.

GB 2 085 598 A

SPECIFICATION
Improvements In or Relating to Variable-area
Fluid Flowmeters

5 This invention relates to variable-area fluid
flowmeters of the kind comprising an internally
tapered tube and a float contained within the tube
and free to move therealong. In use the tube is
mounted vertically with the wider end uppermost.
10 The fluid is caused to flow upwardly through the
tube and, by reason of the internal tapering of the
tube, the float rises within the tube until it reaches
an equilibrium position which position provides an
indication of the rate of flow of the fluid.

15 The tube of such a flowmeter is typically made
of an electrically insulating material and it is
possible in such a case for an appreciable
electrostatic charge to appear on the internal
surface of the tube. This can arise, for example, if
20 the flowmeter is shaken or temporarily disturbed
from its vertical position so that the float rubs
against the tube. In the presence of such an
electrostatic charge the float may be attracted
into contact with the tube, and will thus be
25 prevented from responding to changes in the rate
of flow of the fluid. The effect is particularly
noticeable when the fluid in question is a dry gas.

To overcome this problem, it has been
proposed, in British Patent Specification No.
30 1,329,903, to employ a tube whose internal
surfaces are provided with a material of high
electric conductivity that can be connected to
ground.

35 According to another proposal, in British
Patent Specification No. 1,511,369, both the
internal and the external surfaces of the tube are
coated with an electrically conductive substance
and there is no provision for electrically
connecting either coating to ground.

40 We have now found that an electrically
conductive coating can unfortunately cause
corrosion of the float when made of metals such
as aluminium alloys. This adversely affects the
accuracy of the instrument. We have also found
that a float made of a plastics material, while not

45 corroded in this way, suffers from a recurrence of
the electrostatic sticking problem.

According to the present invention, there is
provided a variable area fluid flowmeter of the
kind specified, in which the tube is made of an
50 electrically conductive material or has on its
internal surface a coating of a material of high
electrical conductivity compared with the material
of the tube, and the float is made of titanium
metal.

55 The float is preferably made by milling, turning
or similar techniques from a solid titanium bar.
Alternatively, it can be fabricated from sheet
titanium or by sintering titanium metal powder in
an appropriately shaped mould.

60 The tube can be as described in either of the
patent specifications referred to above. Thus,
where the tube is of glass, it can conveniently
have a conductive coating of tin oxide as
described in either of British Patent Specifications
65 1,329,903 and 1,511,369. However, it has been
found that an electrical connection to ground is
unnecessary even where there is a conductive
coating on the interior surface only of the tube. In
fact this is, for simplicity, a preferred form of
70 flowmeter.

Claims

1. A variable-area flowmeter of the kind
specified, in which the tube is made of an
electrically conductive material or has on its
75 internal surface a coating of a material of high
electrical conductivity compared with the material
of the tube and the float is made of titanium
metal.

2. A flowmeter according to Claim 1, in which
80 the tube has a coating of electrically conductive
material on its internal surface only and there is
no provision for electrically connecting the
coating to ground.

3. A flowmeter according to either Claim 1 or
85 Claim 2, in which the float is made from a solid
bar of titanium metal.

4. A float made of titanium metal for a
variable-area flowmeter of the kind specified.